2.3 Extraction Well Upgrades and Repairs Completed

WCL has upgraded or repaired a total of 8 wells in the HWMF well field. On April 10, 2006, the CAMU sump received a new submersible pump and daily pumping began. WCL is completing installation of 6 pneumatic pumps and replacement of 5 control skids on various wells within the HWMF well field. On April 19 Calcon installed a 3-inch submersible pump into LEW97-14, which had been disabled due to a bent casing. To date that rehabilitation effort has not been completed. Table 1 presents a list of all wells within the HWMF/E-22R well field summarizing current status, recent upgrades, and equipment replacements. As of May 1, 2006 a total of 20 wells are available for use.

Within the E-22R Area, non-rigorous pump-testing has been conducted on extraction wells EW-7 and EW-13. This has been in anticipation of possible inclusion of these wells into the E-22R extraction system. Preliminary results indicate, as expected, that the wells will produce sufficient volumes to be viable extraction wells in the E-22R dewatering system.

3.0 MEDIUM TERM PLAN FOR NEW WELLS AND PIEZOMETERS

This section describes the current plans for installation of new wells and piezometers as part of the Stage 2, Medium Term Plan. It also provides a description of the wells and piezometers that WCL will be installing in the near future.

3.1 Performance Evaluation by Landfill Sector

For the purpose of evaluating hydraulic gradient and well field performance, the HWMF perimeter has been divided into 11 management zones (Figure 4). The zones are identified in most cases by the inboard piezometers that they incorporate. The following evaluation outlines the current gradient across the slurry wall in each zone, the general well performance, and the need for additional extraction wells or piezometers. Table 2 summarizes the results of this evaluation.

The need for additional extraction wells are based on the following factors:

- The volume of leachate being removed from the management zone is relatively small. However, as it has not been possible to obtain current extraction flow rates for the existing wells, prior estimates developed by the field geologists have been used; and/or

- The rate of change in the hydraulic gradient across the slurry wall is not considered to result in an inward gradient in the near future; and/or
- Problems have occurred or are anticipated to occur with the existing extraction wells.

Where the above evaluations are conclusive additional extraction wells or piezometers were selected as appropriate. However, in several cases there may be a need for additional extraction wells where rehabilitation efforts on currently disabled wells fail. WCL has elected to categorize these as contingency wells, which would be installed as necessary. The need for these contingency wells would be assessed prior to the mobilization of well installation equipment.

In locations where it was difficult to judge the rate of change in hydraulic gradient, additional piezometers were added to the program. New piezometers will also be installed in locations where the existing piezometers are deteriorating and the data collected from them is considered unreliable.

The results of the evaluation of hydraulic gradient and well performance within the specified management zones are discussed in the following paragraphs:

Near PZ-10

An inward hydraulic gradient has been established in this zone, due in large part to relatively high production from extraction well LEW97-15. Unfortunately, this well has been disabled by the presence of viscous NAPL. Recent piezometric data indicate that the inward hydraulic gradient is slowly deteriorating, and without significant leachate production in this area, that trend will likely continue.

If pumping from extraction well LEW97-15 cannot be restored, a replacement well (contingency well) will be installed.

Near PZ-12

An inward hydraulic gradient has been established in this zone and the wells are functioning properly, therefore no new wells are required.

Near PZ-14

An inward hydraulic gradient has not been established here and the current trend in head differential is stable. Two wells in this area and the nearby CAMU sump are functioning, so it is possible that with the dewatering of the CAMU this summer, gradient will become neutral or inward. Nevertheless, a significant gap exists between PW-1R97 and the PZ-12 zone well cluster. To fill this gap, WCL proposes installing one well in the area west of PW-1R97.

Near PZ-16

An inward hydraulic gradient has not been established here. The current trend suggests a neutral or inward gradient may not be achievable with the current well configuration; therefore, two new wells will be installed in this zone.

Near PZ-18

An inward hydraulic gradient has not been established here. The current trend suggests a neutral gradient may be achievable with the current extraction wells; however, several more months of piezometers data will be required to determine the need for additional wells in this zone.

Near LEW91-4

Well performance in this zone cannot be easily evaluated as no piezometer pair is available. Consequently, WCL will be converting one of the leachate extraction wells to an inboard piezometer and converting an E-22R extraction well (EW-1A) to an outboard piezometer. The leachate extraction well to be converted will be replaced by a new extraction well. Near the north boundary of this zone, a second new extraction well will be installed to fill the gap between LEW97-2 and LEW97-3. Therefore 2 extraction wells will be installed in this area.

Near PZ-4

An inward hydraulic gradient has not been established here, and the current trend in head differential suggests a neutral or inward gradient may not be achievable with the current well configuration. A new well will be required in this zone.

Near PZ-6

An inward hydraulic gradient has been established in this zone and the wells are functioning properly.

Near LEW97-9

Well performance in this zone cannot be easily evaluated as no piezometer pair is available. However, the hydraulic gradient exhibited by nearby piezometer pair PZ-8/PZ-7 indicates a neutral gradient has been achieved in this area. Nevertheless, these piezometers will be replaced because they have suffered subsurface well casing deformation.

In addition, extraction well LEW97-9 is not functioning due to a bent casing; therefore a replacement will be required to augment inward hydraulic gradient in this zone.

Near PZ-8

A neutral hydraulic gradient has recently been established in this zone. However, extraction well LEW97-11 is not functioning due to a bent casing. A replacement will be required.

In addition to hydraulic gradient, individual extraction well production must be evaluated using totalized well volumes. A concerted effort has been made to determine the volume of leachate extracted over the past several weeks, however, due to technical difficulties; the data is not yet suitable for interpretation. Going forward, individual flow totals will be recorded weekly and well performance evaluations will be conducted on an ongoing basis.

E-22R Area

In the E-22R area WCL has decided to increase the reliability and extraction capacity from this area by putting into service three existing wells (EW-3, EW-7 and EW-13) nearer the center of the area, and converting the existing extraction well (EW-1A) to a piezometer.

3.2 New Extraction Wells

Based on the evaluation discussed above, WCL plans to install 8 new leachate extraction wells in the HWMF as part of the New Well Program (Table 3). Proposed well locations are shown on Figure 5.

The wells in zones PZ-14, PZ-16 and PZ-4 are specifically for the purpose of obtaining favorable hydraulic conditions. Those in zones LEW97-9, LEW91-4, and PZ-8 will act as replacement wells.

3.3 Contingency Replacement Extraction Wells

WCL has identified two (2) contingency extraction wells for the purpose of replacing disabled wells that could not be repaired (Table 3). Contingency wells would become used in the event that LEW97-14 and/or LEW97-15 were not returned to service.

3.4 New Piezometers

As indicated above, two new piezometers will be installed to replace PZ-7 and PZ-8, and two existing extraction wells that are currently not used (LEW91-2 and EW-1A) will be converted to monitoring wells/piezometers.

3.5 Extraction Well Conversions

As discussed above, wells EW-3, EW-7, and EW-13 will be equipped with pumps and controls, connected to the existing conveyance piping system that connects EW-3 to the LTS. These wells will be used as the main extraction wells in the E-22R Area. The existing extraction well, EW-1, will be used as a piezometer.

4.0 MEDIUM TERM CONVEYANCE PIPING UPGRADES

This section describes upgrades to the existing well head and conveyance system at the HWMF. Five additional wells will be added to the HWMF and into the upgraded conveyance system.

4.1 Well Heads

Twenty four (24) well heads currently located in the HWMF will be upgraded and 8 additional well heads will be newly constructed, as part of the installation of new wells described in Section 3.2. In addition as described in Section 3.5, 3 extraction wells in the

E-22R area will be connected to the existing conveyance system. Figure 5 shows the locations of the newly constructed wells, and the well heads will be upgraded or constructed as shown on Figures A-1 through A-5 in Appendix A.

Each well head and well head assembly will include:

- A 4 ft x 4 ft x 4 ft deep concrete well box. The well box will protect the well head components from exposure to the elements, provide leak detection capabilities, and provide a connection point between the double wall conveyance piping and internal wellhead components. The well box will be installed so that potential leaks from the well head assembly would be contained and detected in the bottom of the box.
- Termination flanges for the double wall conveyance piping. Remaining piping and fittings inside the well box will be single wall, schedule 80, threaded polyvinyl chloride (PVC).
- Unions allowing the entire well head assembly, connecting the double wall piping to the well, to be easily removed.
- A check valve to prevent fluids in the conveyance system from being pumped back into the wells.
- A spacer for addition of an inline flow meter and sensing equipment.
- A 2-inch ball valve for positive isolation of the well from the conveyance piping.
- A 10-inch, schedule 40 tee that encloses the connection of the 4-inch or 6-inch diameter wells to the well head assembly and conveyance piping. The tee is used as a convenient semi-enclosed housing to allow electrical controls, air lines and other components to be connected down-hole in the well. The tee also provides access to service and monitor the well. Use of the tee reduces incidental release of vapors from the well to the atmosphere.
- The well head box will also provide for controls and remote sensing equipment/sensors not shown on the figures.

4.2 Conveyance Piping

The HWMF currently has approximately 4,500 lineal feet of conveyance piping connecting the existing 24 wells to the onsite LTS. The existing aboveground piping has been in service for several years and was constructed of PVC. The piping will be upgraded to below-grade, double wall, HDPE piping manufactured with carbon black to improve degradation from sun exposure. In addition, the new piping will be installed below grade to reduce the potential for expansion and contraction associated failures.

Currently there is a separate conveyance piping connecting E-22R Area to the LTS. The piping connects EW-1A, EW-2 and EW-3. There is a 10" conduit that runs north south in the E-22R Area. Extraction wells EW-7, and EW-13 will be connected to the conveyance piping at EW-3 via the 10" conduit. (Figure 6). The piping will be similar to those used for the HWMF.

The conveyance piping upgrade will connect the existing 24 wells and the proposed 8 new wells as shown on Figure 6. In addition, the current conveyance system piping is not a complete loop. The piping between extraction well LEW91-1R97 counter clockwise to extraction well LEW97-13 is on a separate branch from the piping that connects extraction wells LEW97-14 through LW90-3R97. The new piping will complete the loop between extraction wells LW90-3R97 and LEW91-1R97.

The new HDPE double wall piping will consist of an inside 2-inch diameter carrier pipe and a 3-inch diameter outer containment pipe. Several double wall configurations were considered. Leak detection can be provided using a continuous leak sensing cable between the inner and outer wall and/or by use of low point detection sump in the outer wall. The leak sensing cables potentially result in false positive reporting and are typically not installed without the low point detection sumps, since leaks cannot be evacuated unless the sumps are in place. In addition, the cable system requires larger diameter outer piping. The low point detection sumps provide visual confirmation of potential leaks, provide an access point to drain the outer wall after leaks are repaired, and sensors can be placed to provide remote leak detection.

Double wall piping can also be manufactured with the carrier pipe and centralizers assembled within the outer pipe or by an extrusion method that co-extrudes the entire assembly as one unit. The extruded section has an advantage in that differential expansion/contraction between the two pipes is avoided.

Weighing the above alternatives, the extruded pipe with low point drains was chosen for the HWMF. The smaller 2x3 piping is easier to install, has greater flexibility for installation and the leak detection sumps provide the same degree of remote leak detection. Approximately 6,000 lineal feet of new piping will be required to connect the existing 24 wells, 5 proposed wells, and to provide a complete loop between extraction wells. An additional 600 feet will be required in the E-22R Area.

A schematic depiction of the conveyance system in profile is shown on Figure A-2 in Appendix A. The figure shows 3 potential well heads at differing elevations and the various components of the system that connect the wells. Components shown on the figure in addition to the piping and well heads include:

- A block valve shown between well B and well C. Block valves will be installed at approximately 16 locations around the conveyance pipe loop. The block valves allow sections of the loop to be isolated for repairs to the piping without disrupting the entire conveyance system. The valves will be located inside a 3 ft x 3 ft x 3 ft deep concrete valve box, as shown in Figure A-3. The box serves as a connection point between the double wall piping and the 2-inch diameter ball valve. The box also serves to provide leak containment from the valve connections and a leak detection sensor would be placed inside the box. Some of the valve boxes would include a tee fitting, not shown on the figure, which allow connection of additional wells at a later time.

- Low point detection stations. These stations would be located at low points along the profile grade between two well heads. Figure A-4 in Appendix A shows a typical low or high point detection station. A minimum of one station would be located between well heads. Additional stations would be placed, if adjacent well heads are more that 100 feet apart. As shown on Figure A-2 each low point station also has a corresponding high point station. The high point station is not for leak detection, but serves as an access point to air evacuate the outer pipe to clear leaks and dry the system. Each block valve would also require a corresponding low and high point detection system, as shown on Figure C-1. The low point stations would be located in a utility box and would include a leak sensor as shown on Figure A-4.

Figure A-5 shows a typical burial section for the conveyance piping system. As depicted on the figure, a typical burial trench is not being used. The HWMF facility includes a 60 mil HDPE liner, approximately 18-inches below grade. A standard trench section would penetrate this liner and therefore is not used.

The actual depth of piping below grade will vary depending on elevations between well boxes, but will typically be 4- inches. To obtain adequate cover on the piping protecting from potential traffic at the facility, but also to reduce potential expansion/contraction issues, an above ground cover section is added.

The burial trench and cover section will be sized to provide for the air supply line needed for the proposed new air driven well pumps. Additionally, control wires for the well head sensors, flow meters and leak sensor cables will be located inside one or more conduits which will be also co-located with the conveyance piping and airline.

5.0 WELL AND PIEZOMETER INSTALLATION PLANS & PROTOCOL

5.1 Health and Safety Protocols

Prior to installing and developing additional leachate extraction wells at the site, and in accordance with WCL's Heath and Safety Plan for the closure of the HWMF (Field Solutions, Inc. [FSI], 2000), a project-specific H&S plan will be prepared for the well and pipeline installation work. The HWMF Closure Plan and the existing H&S plan for the closure activities indicates that a separate project specific H&S plan will be prepared to supplement the closure H&S plan.

5.2 Well And Piezometer Installation Procedures and Design

Leachate extraction wells will be installed at the approximate locations identified on Figure 5. Prior to well installation, each proposed well location will be prepared by removing the approximately 1.5 foot thick vegetative soil layer, geotextile separator, pea-gravel drainage layer, and LLDPE geomembrane which all overlay the minimum 2-foot thick low permeability clay layer. The excavated vegetative soil layer and pea-gravel will be segregated for later re-use of these materials. A small section of the LLDPE geomembrane (e.g., approximately 6 ft x 6 ft) will be removed to create a drilling window through which the well will be installed. The opening of the exposed area will be measured to staked reference points. The exposed pea gravel on the sides of the opening will be temporarily sealed with an impervious plastic sheet (visqueen or similar), and temporarily covered with soil or sandbags to anchor the sheet. This will minimize the potential for any drilling fluids, leachate or other debris from entering the exposed gravel. Clay soil will then be placed back in the shallow excavation and compacted with landfill equipment to create stable surface for drilling operations.

A sonic drill rig, equipped with 4- to 7-inch diameter coring capabilities and 8- to 12-inch internal diameter (ID) drive casing will be used to install the leachate extraction wells. Sonic drilling techniques have the potential for installing wells with greater well efficiencies than the hollow stem augers previously used for leachate well installations at the site. Alternatively, either a hollow stem auger drill rig, equipped with 8- and 15-inch augers, or a bucket auger rig may be used to install the leachate extraction wells.

An exploratory boring will be performed for each extraction well. Cone penetrometer test (CPT) borings or Geoprobe sampling may also be used to evaluate potential well placement. During drilling of the exploratory boring for each extraction well, continuous samples will be obtained with a split barrel sampler. A geologist under the direct supervision of a California registered geologist will log the materials encountered during the drilling of the exploratory borings consistent with the Unified Soil Classification System.

Each leachate extraction well will be constructed with flush-threaded, 6-inch diameter (nominal ID) PVC well casing and 0.010- or 0.020-inch ID machine slotted PVC well screen, as shown in Figure 7. An appropriately sized filter pack will be placed in the annular space between the well screen and the borehole wall (if borehole conditions allow) and will extend to the top of the screened interval. Pre-pack dual wall well screen may be used where filter pack placement is anticipated to be difficult because of flowing sand or silt. An intermediate seal consisting of bentonite chips or pellets will be placed on top of the filter pack and hydrated in situ. The remaining annular space will then be backfilled to the land surface with a bentonite grout (e.g., Quick Grout®). The well casing for each completed leachate well will extend 2 to 3 feet above ground surface to provide sufficient material for site personnel to plumb each extraction well with the appropriate connections, for later incorporation into the site's existing leachate collection system.

Piezometers will be installed following the same procedures as wells with the exception that the nominal diameter of the piezometer will be 2 inches. Figure 8 depicts the piezometer design.

On completion of well and piezometer installation, the temporary surface seal and surface soils adjacent to the drilling window will be removed to expose the surrounding LLDPE liner. The liner will be repaired and a LLDPE boot will be raised around the well casing to a height at least one foot above the final cover elevation. The pea gravel drainage layer, geotextile separator and vegetative soil cover will then be restored at the well location and soil will be placed back over the drilling window to raise ground surface to near its original elevation. Construction Quality Assurance (CQA) supervision of the repair of the LLDPE liner, the installation of the well casing boot, and the restoration of the final cover will be performed to ensure proper well construction. After the soil is placed, measurements from the staked reference points will be used to identify and mark the drilling location.

Soil cuttings generated during drilling operations along with any contaminated personal protective equipment (PPE) will be placed in soil bins or other suitable container for transfer to the CAMU. All drilling equipment will be decontaminated by steam-cleaning prior to leaving the site. The steam cleaning fluids will be containerized and transferred to the influent tank of the LTS.

5.3 Well and Piezometer Development and Evaluation Procedures

The purpose of developing the leachate extraction wells is two fold. First, well development will be performed to remove silt and sand sediment in the well casing and sand pack, and reduce the effects of borehole damage caused by the drilling process, so that leachate will flow more freely to the well. Second, the development process will provide information regarding potential well yields so that appropriately sized submersible pumps can be selected for the wells.

A well development rig (e.g., Smeal rig) will be used to develop the wells and piezometers. The well development activities will consist of five basic steps (bailing and purging, swabbing of the well with a surge block, leachate containment and transport, and development of wells with floating NAPL). The well development team may alternate the standard development techniques (i.e., incorporate longer or shorter development times, switch and alternate equipment, and modify and adjust the planed hydraulic evaluation methods based on the field conditions, recharge rates, and the ease or difficulty of well development). In some instances, the hydraulic evaluation may not be possible. Health and safety protocols will be followed as specified in a job-specific H&S plan (Section 4.1). Appendix B includes a description of the steps the well development team will follow.

5.4 Conveyance Pipelines

The conveyance pipelines will be installed at the HWMF and E-22R Area as shown on Figure 6 and on Figures A-1 through A-5 of Appendix A. Construction drawings incorporating the details in these figures will be prepared for WCL approval and issued for construction. Figure A-2, which shows a schematic representation of the well heads and conveyance piping, will be replaced with final construction drawings showing all the existing and proposed wellheads. The actual locations of block valves, low point leak detection sections and high point stations will be shown. The bottom grade for well head boxes, valve boxes, low/high point stations and depth of cover on piping will also be shown.

Prior to setting wellhead boxes, proposed low point stations and well head elevations will be field verified and field located. The elevation of the low point stations and the bottom of the well head boxes will then be set to maximize the slope of the pipe between well heads and low point stations.

Figure A-1 shows the elevation of a typical well head box and the relationship between the bottom of the box, the existing ground surface and the top liner. The maximum depth for setting the bottom of the box is 15" below grade. This depth provides a cushion between the bottom of the box excavation and the liner. The depth of the liner will be verified by probing prior to excavation using equipment.

Block valve boxes, as well as valve boxes with tee fittings, for future tie-in of additional wells will also be field located prior to beginning work. The conveyance system crosses below several site roads and at the existing and proposed crossings the piping will be placed through steel carrier pipe. These locations should be located. After the fixed points are located, the fusion of the conveyance piping can be started. To allow correct alignment of the piping, as it enters the well head and valve boxes, the piping can be laid with gradual curvature to produce the desired alignment. Additionally, the pipe assembly inside the well head has a swing fitting so the alignment of the conveyance piping to the well head assembly can be adjusted, as necessary. The alignment of the conveyance piping should be carefully marked on the well and valve boxes before making appropriate penetrations in the concrete box walls.

A large penetration (8- to 10-inches) should be made in the bottom of the well box as shown in Figure A-1 and the well box carefully lifted and lowered over the well and set on grade. The valve boxes should also be set in place. Short pieces (less than 3-feet) of the conveyance piping will need to be fused to the termination flanges and projected outside the well head and valve boxes. These small stub sections (2 at each box) can then be fused to the main conveyance system.

Prior to excavating for partial burial of the conveyance piping as shown on Figure A-5, the proposed alignment will be carefully probed to verify the actual depth of the cover liner. Field adjustments should be made as necessary to maintain 3 inches of clearance above the liner.

The low point stations are fused into the conveyance pipe at the field verified locations. After the piping system has been pressure tested, the low point stations and piping can be covered and the low point station and sensor cable brought to grade inside a standard utility box as shown on Figure A-4.

Hydrostatic pressure testing of the carrier piping will be accomplished between adjacent well boxes and/or block valves. Hydrostatic or compressed air (< 10 psi) testing of the outer containment pipe will be performed between low point and high point detection stations.

After the conveyance piping, low/high point detection systems and valve boxes are in place the well head assemblies can be completed and the airlines, conduits, down-hole equipment including pumps, leak sensors, flow measuring equipment can be installed. The well head and valve boxes will then have the penetrations from the wells, piping, conduit, and air lines sealed with grout and weather tight sealant. The concrete boxes should be set with a slight grade, or a false grout bottom constructed to allow potential leaks to drain toward a leak detection sensor.

After completion of the installation, each well head should be sequentially activated until the entire system is operating and each monitoring point and valve can be checked.

6.0 OPERATIONS AND MAINTENANCE

This section describes how the extraction well and conveyance piping systems will be operated and maintained. A well and pipeline operations and maintenance (O&M) manual will be produced to summarize the requirements and to provide a basis for operator training.

6.1 Operational Procedures

6.1.1 Extraction Wells

The extraction wells will generally be operated in an automated mode as follows:

Well operations will be controlled by the PLC and its programmed parameters. These parameters will include:

- Well level start and stop setpoints
- Well flow setpoints
- Well low flow alarms
- Well pump fail alarms

These control setpoints can be monitored and adjusted via the SCADA system PC.

When necessary, i.e. during well troubleshooting or repair work, the well will be operated in a manual mode as follows. If the well has a pneumatic pump then the air solenoid valve will be activated to energize the pump to operate at the pumps maximum capacity. If the well has an electric pump then the well will pump until it hits the low level cut off, and its speed will be dependent on the position of the potentiometer.

Data collection and recording will be an important part of the operations. Automated records of volumes pumped will be maintained and will be checked using manual readings off the totalizer gauges on a monthly basis.

6.1.2 Pipeline Leak Detection Systems

The conveyance piping conveyance system will have leak sensors installed at the following locations:

- Each well head box
- Each low point station
- Each block valve box
- Each valve and tee box for future addition of wells

The leak detection system will connect to a common monitoring panel that will provide an alert if a signal is received from any of the sensing points. Each alert will be recorded and will result in two actions: 1.) the SCADA system will be notified and the HWMF extraction well system will be automatically shut down. 2.) Site management personnel will be notified by pager, cell phone or facsimile machine, as necessary, to provide immediate response to the alert. Once the alert has been investigated, the problem area can be isolated using the block valves; and the remainder of the system can then be placed back in to operation.

A log will be maintained indicating the monitoring system status on a daily basis. Each alert will be indicated on the log showing the date and time of alert, as well as the name of the response personnel, and the time and response actions taken. Subsequent repairs to the system should also be shown on the log, including the date, time and person responsible for placing the system back into operation.

6.2 Maintenance Procedures

6.2.1 Extraction Wells

The following maintenance will be conducted on the wells and associated controllers:

Quarterly

- Clean and inspect flow meter paddlewheel.
- Clean and inspect level transmitter.

Semi-Annually

- Clean and inspect radio antenna connections and redo as needed.
- Clean and inspect well pump hoses and fittings.

6.2.2 Conveyance System

The following maintenance will be conducted on the conveyance system:

Daily

- Check remote monitoring systems and complete necessary logs.
- Verify remote recording equipment is operating.
- Check and immediately repair obvious system faults.

Weekly

- Physically walk system and inspect visually.
- Inspect well heads for obvious problems.
- Inspect valve boxes.
- Randomly inspect low point stations (such that each station is monitored once during the month).
- Make repairs, as necessary.
- Following significant rains the concrete well and valve boxes should be inspected and covers /penetrations maintained to prevent leaks.

Monthly

- Physically walk system and inspect visually.
- Inspect well heads for obvious problems and test leak sensor.
- Inspect each low point station, verify that leak is not present and test sensor.
- Inspect each valve and tee box, verify leak is not present and test sensor.
- Repair sensors and/or leaks in well head assemblies, as required.

Annual

- Randomly pressure test each of the conveyance piping sections such that the entire system is tested once over a five year cycle.
- Conduct an emergency response test to verify that leak alert is detected and that response personnel follow correct procedures.

7.0 LONG TERM EXTRACTION PLAN DEVELOPMENT

7.1 Introduction

The existing leachate extraction system, as modified by the changes proposed in Section 3.0 above, represents the optimum approach to achieving the initial dewatering of the HWMF and E-22R Area and providing gradient control along the slurry wall surrounding the HWMF and E-22R Area. As described above, its design and operation is based on available field data, and uses observations of volume of leachate extracted and the responses in the levels measured in the piezometers, to guide the location of a sufficient number of extraction wells.

Over the next year, leachate levels in the HWMF and E-22R Area will decline and extraction will have to occur from shallower depths. This may make it more difficult to maintain sufficient drawdown to achieve the necessary gradient control in the long term. Furthermore, it may also become necessary to refine the existing long-term extraction plan (as outlined in the Postclosure Plan) so that it is efficient, simple, and cost effective to operate. This will require selecting key wells that need to be pumped and determining pumping schedules that will allow for a sustainable long term operating cycle and provide sufficient down time for routine maintenance and repairs. For example, if pumping from one or more selected key wells in a particular leachate extraction zone provides sufficient leachate drawdown to create an inward hydraulic gradient, then any additional wells in that zone may used as leachate piezometers and/or designated for use as backup extraction wells in the event a key extraction well should become damaged.

WCL believes the best way to operate such a long term system is to have a selection of key extraction wells and, if required, a leachate conveyance system that allows leachate of different chemical and physical characteristics to be separately conveyed to the LTS. The LTS should be able to treat different streams that can enter the treatment sequence at